

# DOCUMENT RESUME

ED 193 015

SE 031 928

TITLE Conservation Careers. Revised Edition.  
 INSTITUTION National Wildlife Federation, Washington, D. C.  
 PUB DATE 79  
 NOTE 13p.; Contains colored drawings which may not reproduce well.  
 AVAILABLE FROM National Wildlife Federation, 1412 16th St., N.W., Washington, DC 20036 (single copy free, additional copies \$0.15 each).  
 EDRS PRICE MF01/PC01 Plus Postage.  
 DESCRIPTORS \*Career Awareness; \*Career Choice; Career Planning; \*Careers; \*Conservation (Environment); Conservation Education; Environment; Environmental Education; \*Natural Resources; Occupations; Sciences

## ABSTRACT

This pamphlet provides a partial listing of career opportunities in natural resources management. Educational requirements are discussed and potential employers are listed. Pay is described as "adequate." Sources of additional information are included. (BW)

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# CONSERVATION CAREERS

Prepared By the NATIONAL WILDLIFE FEDERATION

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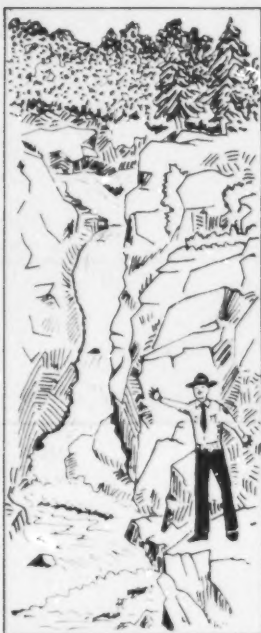
*I pledge myself, as a responsible human, to assume my share of man's stewardship of our natural resources.*

*I will use my share with gratitude, without greed or waste.*

*I will respect the rights of others and abide by the law.*

*I will support the sound management of the resources we use, the restoration of the resources we have despoiled, and the safe-keeping of significant resources for posterity.*

*I will never forget that life and beauty, wealth and progress, depend on how wisely man uses these gifts . . . the soil, the water, the air, the minerals, the plant life, and the wildlife. This is my pledge!*



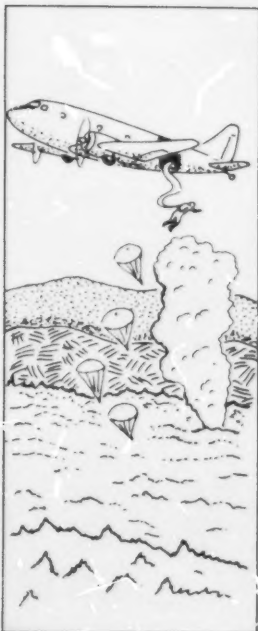
## CONSERVATION CAREERS

Conservation is the wise use and management of natural resources—the soil, the water, the forests and other plant life, the dependent wildlife, the rich minerals, the very air we breathe.

Without an understanding of these resources, how they work together and how we must use them, there is little hope for a quality life and healthy environment in the future.

Our main job at the National Wildlife Federation is to make the public aware of the need for conservation. One way to do this is to assist those who seek a career in conservation. As the importance of conservation and environmental quality grows, more and more people will be needed to help us use our resources wisely.

## WHAT ARE TYPICAL KINDS OF CONSERVATION JOBS?



This depends on the field of your interest. If it's forestry, for example, the jobs include heavy equipment operator, fire dispatcher, forester, laborer, log scaler, mechanic, parachute packer, payroll clerk, recreation area custodian, recreation guard, research aide, road crew foreman, smokechaser, smokejumper, survey party chief, timber cruiser, and warehouseman.

This partial list gives you an idea of the variety of work necessary to keep our forest resources secure.

Well, to be specific, just what does a "forester" do?

He may direct land surveys, road construction, and the planting and harvesting of trees. Or he may be a specialist in protecting trees from insects, disease, and fire. He plans forest land uses and practices. Usually he is working with people: timber harvest crews, firefighters, tree planters. He may administer private forest preserves, pub-



lic land, or lumber company property. He may spend his time in research or in teaching forestry. Just in this one category of forestry—"forester"—you can see how many different kinds of work there are.

For another example, take that broad vocational expanse called "environmentalist." Careers related to the environment are found in government (local, state, federal), private industry, and educational and research institutions.

**The federal government** is busy setting and enforcing pollution standards, such as those for air quality; researching the causes, effects, and control of environmental problems; and assisting state and local governments. It funds research and develops and demonstrates new pollution control techniques. Its activities require the services of meteorologists, oceanographers, toxicologists, bacteriologists, lawyers, engineers, statisticians, sociologists, and other highly educated specialists. There is room also for workers with lesser education requirements: laboratory or instrument technicians, repair and maintenance people, computer specialists.

**Local and state governments** need workers in waste disposal systems, air pollution control enforcement, urban planning, food protection, sanitation—to name just a few.

**Private industry** is using more and more pollution control specialists and people who understand how to develop and market equipment for cleaning air and water or systems to reclaim useful materials from waste.

**Educational and research institutions** need teachers of environmental subjects, scientists, and engineers.

That's a bird's-eye view of the "environmentalist" field. There are numerous specialties in that field that have not been mentioned. Let us take a closer look at one that was: urban planner.

Urban planners work with the problems of our cities and suburbs. These experts may pursue even narrower specialties, such as transportation, urban renewal, urban design, social service, economic and resource development, and planning administration.



The transportation planner may be versed on highways, streets, mass transit systems, and the interplay of the various modes of transportation. Urban renewal planners are concerned with relocation of existing businesses and residents, rehabilitation of old but well-built structures, demolition of unsound buildings and their replacement by new ones, location of schools and other necessary neighborhood facilities.

Urban designers rely on techniques from architecture and landscape architecture as well as planning principles. They often work on large-scale development projects such as public building complexes.

Social service planning is a relatively new branch which helps guide public services such as education, health services, criminal justice, environmental health, and social welfare.

Economic and resource development planners aim to increase employment or industrial growth in an area. Resource development planning concentrates not only on economic objectives but also on conservation of natural resources.

Planning administration involves legal aspects of planning, contact with legislators, budget and training work, and coordination functions. Other planners handle program evaluation, zoning ordinances, housing codes, and so on.

How does a planner go about his work? First he analyzes the problem, such as deficient housing. Then he sets goals and objectives, using surveys, public hearings, and other means to find out what people want. After that he devises several programs to accomplish the objectives and evaluates these alternatives. Then he makes a recommendation as to which program to adopt, presenting his proposal carefully so that the officials or public groups making the decision will understand it fully. After the decision is made and put into effect, the planner checks on the effectiveness of it.

To list all of the subject areas in which you might make a conservation career would require a book. We have seen the names of some occupations in forestry and in the environmentalist category and an offshoot, urban planning. An





A to Z listing of conservation career fields could start with "agricultural management" and end with "zoology." Sandwiched in between would be: agronomy, art, bacteriology, botany, chemistry, conservation journalism, education, engineering, entomology, fishery biology, geology, horticulture, law enforcement, park interpretation, photography, plant quarantine and pest control, range conservation, recreation, sanitation, soil conservation, veterinary science, wildlife biology, wildlife refuge management, wildlife research.

## ***HOW MUCH EDUCATION IS NECESSARY?***

Jobs in conservation are like those in many fields in one respect: as a minimum, the professional needs a four-year college degree. In some conservation fields, the abundance of applicants may make it necessary to have a master's degree to be considered.

A forester has a bachelor's degree at least, and may have a master's or Ph. D. degree. He has studied such subjects as dendrology (tree identification), ecology, forest administration, forest economics, forest measurements, forest policy, forest protection, resources management and use, and silviculture.

Because many conservation problems relate both to the natural sciences and to people, the budding forester also takes courses in the liberal arts, such as English and history. A good scientific background and an ability to communicate with people—both are essential.

Required science subjects naturally vary to some extent with individual career plans. If your goal is the field of wildlife biology, for example, and you plan to seek a federal government job, you will need 30 semester hours, or the equivalent, in biological sciences, including nine semester hours in such subjects as mammalogy, ornithology, animal ecology, wildlife management; 12 semester hours in zoology, such as general zoology, invertebrate zoology, vertebrate zoology, comparative anatomy, physiology, genetics (excess wildlife biology courses may be used for this requirement where appropriate); nine semester hours in botany or related plant sciences. If you're



looking for a research position, you must have 12 semester hours in zoology, such as invertebrate zoology, vertebrate zoology, comparative anatomy of vertebrates, embryology, animal ecology, entomology; nine semester hours in training applicable to wildlife biology, animal ecology, wildlife management, etc.; nine semester hours in botany and related plant sciences; 15 semester hours in a combination of two or more of these—chemistry, physics, mathematics, statistics, soils, geology.

The necessary "communications" studies in your program would depend somewhat on your career objective. A wildlife researcher, for instance, might concentrate on learning to write effectively, the better to describe his techniques and results. A wildlife manager or administrator might strive not only for facility in writing but also for skill as a public speaker.

Degrees are now available from many schools in such specific areas as conservation, ecology, range science, environmental science, and environmental communications.

A professional environmentalist would need a college degree, with additional study required for many of the specialties such as teacher or research ecologist. An urban planner would have a degree in a field such as architecture, engineering, political science, sociology, economics, geography, or public administration, followed perhaps by two to three years of graduate study in a planning school. A master's degree in planning is available from some 80 universities in the United States and Canada.

A list of major colleges and universities offering training in the conservation/environment field is contained in the National Wildlife Federation's Conservation Directory, an inexpensive publication which appears annually. It also includes other types of listings helpful to conservationists. Your library may have it.

If you're still in high school and expect to make a career in conservation, take as much mathematics, physics, chemistry, biology, English, history, geography, and social science as possible. Any writing or speaking experience you can get from participating in various organizations or





activities will be valuable later on, in college and in the world of work.

But suppose you don't want to spend four years in college. Does that close the door on a conservation vocation? Not at all. In the field of forestry, to return to that example, not all the work is done by the professional forester. A large supporting staff of technicians, aides, skilled workers, clerks, and laborers is needed. Technicians might lead road crews or survey parties, for instance. Forestry aides might serve as smokejumpers, recreation guards, and so on. Such jobs as carpenter or mechanic require skilled workers who need not have been to college. The same is true of employees classed as laborers, who plant trees and work on roads.

Thus, forestry aides or technicians could get whatever formal education they need in one or two years of college, obtaining the rest of the knowledge necessary through practical experience. In the environmental technician field, a laboratory or instrument technician, maintenance worker or computer specialist could obtain the necessary formal training in a two-year junior or community college, or at a post-high school technical institute, or on the job. A technician assisting an urban planner could qualify educationally on the basis of two years of college. Some junior and community colleges offer two-year programs leading to an associate degree in planning or urban affairs.

A suggestion: summer work in a forest, park, or urban planning office is a good way to gain experience, or to find out if you really want a conservation career. Summer employment of this type, however, is hard to find and there is keen competition. Applications should be made well in advance.



## WHERE ARE THE JOBS?

As this pamphlet is written, there are more people who want to get into conservation work than there are vacant positions. Long range, the outlook is more favorable.

Most jobs are in the federal, state, county, or municipal government. Federal jobs require passing a competitive examination given by the U.S. Office of Personnel Management.

Federal offices which hire career conservationists include the Department of Agriculture (Forest Service, Soil Conservation Service, Extension Service, and others), Department of Commerce, Department of Defense (Army, Navy, Air Force), Department of Health, Education, and Welfare, Department of the Interior (National Park Service, Fish and Wildlife Service, Bureau of Land Management, and others), Department of State, Environmental Protection Agency, Smithsonian Institution, and Water Resources Council.

Many states have somewhat similar agencies.

Teaching in colleges, universities, and high schools attracts many conservation careerists. The private sector offers opportunities as more and more corporations hire people with a scientific conservation background for such work as laboratory research, supervision of timber cutting or renewal, helping recover strip-mined land, or dispensing environmental education and public information. Foundations, museums, community nature centers, zoos—these are among other prospective employers.

The jobs may be located not only in the United States but in Canada, Central and South America, and other parts of the world.

## HOW IS THE PAY?

Adequate. In the federal government, for example, the normal entry level for college graduates is Grade GS-5 or Grade GS-7; see the current federal pay schedule for the exact salary of each grade. Most state agencies pay somewhat less.

As in certain other vocations, money is not the only compensation. The other rewards are substantial: personal satisfaction, the joy of doing a lot of your work outdoors, the realization that you're making it a nicer world to live in now and for future generations.

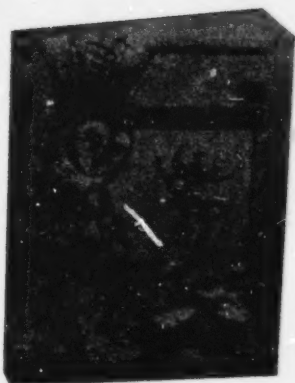




## **ARE CONSERVATION CAREERS OPEN TO WOMEN?**

Yes. The federal government, in particular, specifically opens its jobs to all qualified applicants regardless of sex, race, religion, color, or national origin. Don't forget, it was a female biologist, the late Rachel Carson, who alerted the nation to the dangerous environmental impact of pesticides.

## **WHAT ARE OTHER INFORMATION SOURCES?**



There are many. Some you can find by looking in your local library under subject headings like "Conservation" or "Vocations". The librarian can help you if necessary.

Sometimes professional societies can furnish valuable facts. The Wildlife Society, for instance, issues a pamphlet, "A Wildlife Conservation Career for You". The address of this organization is Suite 611, 7101 Wisconsin Ave., N.W., Washington, DC 20014. Foresters, soil conservationists, range managers, and many other professional groups support professional organizations which may be of assistance. You can find many such organizations listed in the National Wildlife Federation's Conservation Directory.

The Federation also publishes an annual survey, "Compensation in the Fields of Fish and Wildlife Management," which is free.

Among the brochures available from federal agencies describing their career opportunities are:

**Career Outlines.** National Park Service, Department of the Interior, Washington, DC 20240.

**Careers in Soil Conservation Service.** Soil Conservation Service, Department of Agriculture, Washington, DC 20250.

**Career Profiles in Forestry, Conservation, Ecology, Environmental Management.** Forest Service, Department of Agriculture, Washington, DC 20250.

**Employment Opportunities in the U.S. Fish & Wildlife Service.** Fish & Wildlife Service, Department of the Interior, Washington, DC 20240.

**Life Sciences Opportunities in the Federal Government,** Announcement 421, Rev. Aug., 1978. U.S. Office of Personnel Management, Washington, DC 20415.

**Seasonal Employment.** National Park Service, Department of the Interior, Washington, DC 20240.

Other publications which might help you include:

**Careers for the 70s—Conservation, by Ed Dodd.** Crowell-Collier Press, 866 3rd Ave., New York, NY 10022

**Careers in Conservation, by Henry Clepper.** Natural Resources Council of America, 719 13th St., N.W., Washington, DC 20005

**Careers in Environmental Protection, by Reed Millard and the Editors of Science Book Associates.** Julian Messner, 1 W. 39th St., New York, NY 10018

**Careers in Wildlife Conservation, by John Madson and Ed Kozicky.** Conservation Dept., Olin Mathieson Chemical Corp., East Alton, IL 62024

**Making a Living in Conservation—a Guide to Outdoor Careers, by Albert M. Day.** Stackpole Books, Cameron and Kelker Sts., Harrisburg, PA 17105

**Opportunities in Environmental Careers, by Odom Fanning.** Vocational Guidance Manuals, 235 E. 45th St., New York, NY 10017

And now, good luck in your quest!

## ABOUT THE NATIONAL WILDLIFE FEDERATION

The National Wildlife Federation is a private, nonprofit conservation education organization, publicly but not governmentally supported. It aims to inform our citizens concerning the wise management of our natural resources and the importance of a clean environment for man and the other inhabitants of Earth.

One way to do this is by circulating, free in single copies, the many conservation education publications which we produce. People often respond by asking, "What can I do to help?"

One of the best things you can do is to keep an eye on local, state, and federal government actions that might affect the environment. Learn the facts and make your views known in every forum available. You will be doing the environment—*your* environment—a favor.

Something else you can do: join an organization such as the National Wildlife Federation. As a conservation education organization, the Federation is working for a better environment for man and wildlife. If you would like information on becoming a member, please write to us.



## NATIONAL WILDLIFE FEDERATION

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This publication was made possible by contributions to the  
National Wildlife Federation.